America's Army of the 21st Century

FORCE XXI
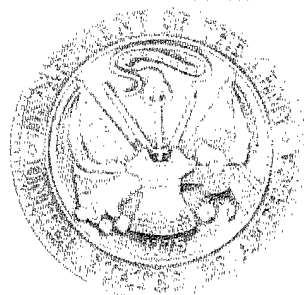
Meeting the 21st Century Challenge

Mary Blake French *Army Magazine*

NOT FOR THEMSELVES
BUT
FOR THEIR COUNTRY

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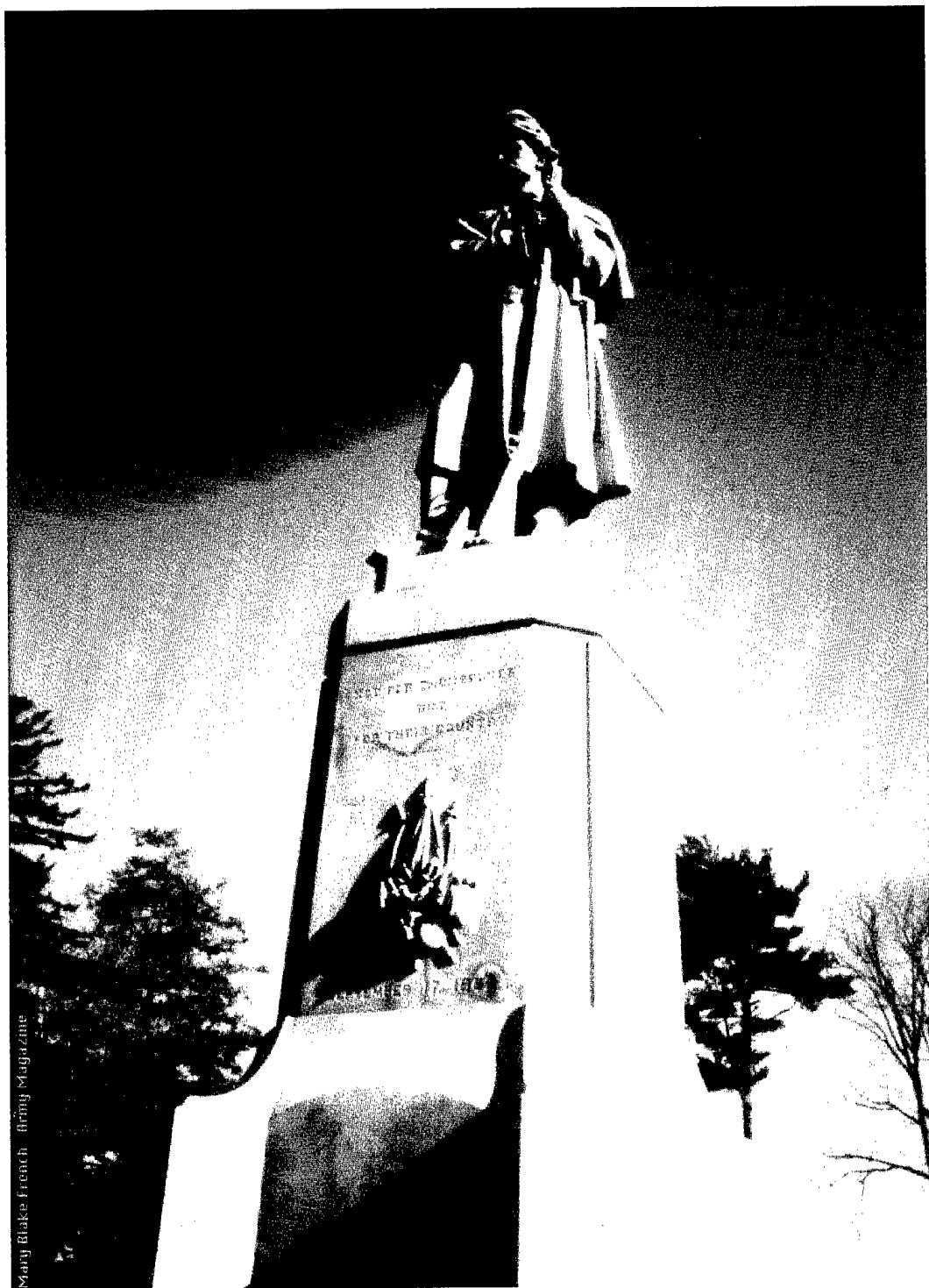
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Force XXI is the reconceptualization and redesign of the force at all echelons, from the foxhole to the industrial base, to meet the needs of a volatile and ever changing world. The central and essential feature of this Army will be its ability to exploit information. Information and digital technologies are creating sucha synergistic effect among all the operating systems, organizations, and components that the Army's capability will be enhanced by an order of magnitude.

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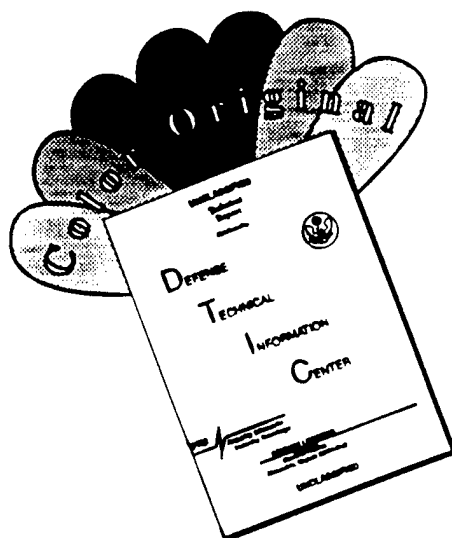
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We are making the Army of tomorrow a reality today. We are creating a force that meets the needs of the 21st Century by leveraging technology so that America can better accommodate the vastly changed geopolitical landscape. This is a complex and difficult process because we are transforming the Army in its entirety while at the same time retaining our fundamental values, fostering our enduring institutions, and keeping the Army trained and ready for today's crises. It's a tough job, but the men and women of America's Army are doing it ... today.

Merely building a smaller version of our Cold War Army — the victorious Army of the Cold War and Desert Storm — will not answer America's expanding national security needs. We need a new, better Army to meet the challenges of the 21st Century. Operation Desert Storm and recent operations other than war around the world have driven that point home to us. To maintain our qualitative edge, we are making fundamental changes in our doctrine, organization, and training. We are creating America's Army for the 21st Century: Force XXI.
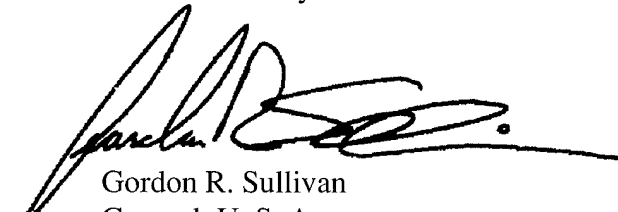
The document that follows tells an emerging success story. It demonstrates that we are on the right track. We have invested the requisite intellectual capital in thinking through what we must become and how to make the required transformation.
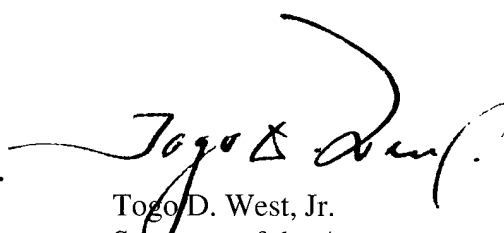
Force XXI is the reconceptualization and redesign of the force at all echelons, from the foxhole to the industrial base, to meet the needs of a volatile and ever changing world. It will be a force organized around information and information technologies. Its purpose will be to deter those who oppose us, to compel when deterrence fails, and to reassure our friends and allies around the world that they can count on us. It will also stand ready to support disaster relief and humanitarian efforts within our own land. We must win the first battle ... whatever it is.

We are decisively engaged now in creating exactly the kind of force America needs in the 21st Century. We are on target and moving out!

America's Army. Count on us!

Gordon R. Sullivan
General, U. S. Army
Chief of Staff

Togo D. West, Jr.
Secretary of the Army

CHANGE

Quality
People

NEW WAYS

Leader
Development

Training

CONTINUITY

*Trained
and
Ready*

ARMY
VALUES

Modern
Equipment

Force
Mix

GROWTH

Doctrine

OLD WAYS
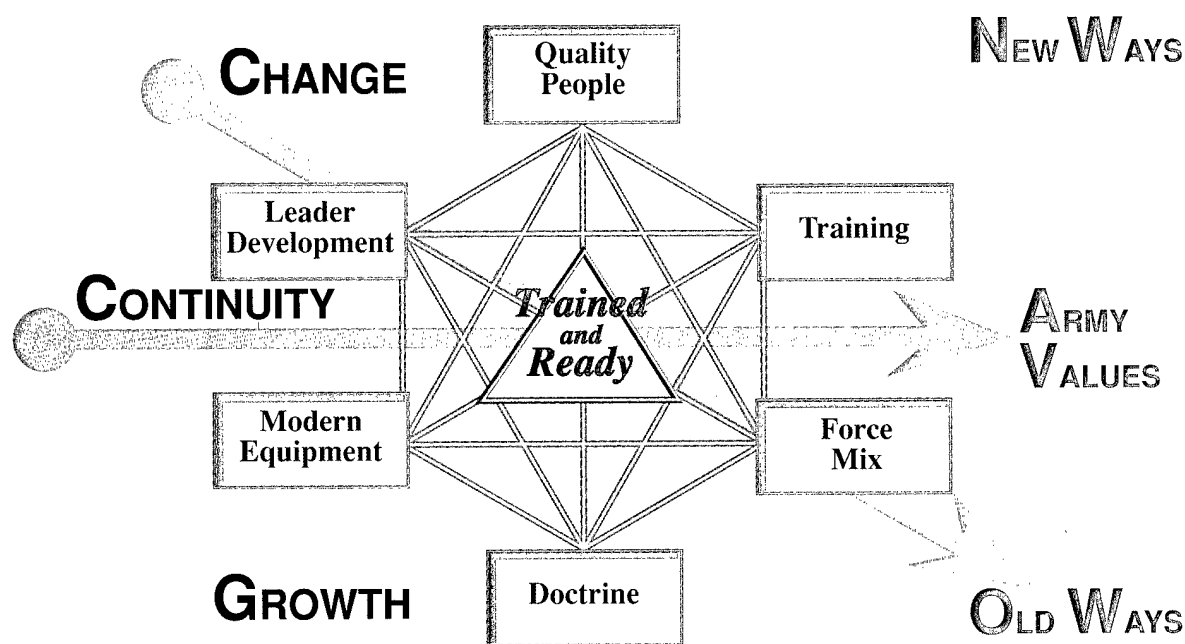
A Changing Institution in the Changing World

VISION

*America's Army,
Trained and Ready, a Strategic Force,
Serving the Nation at Home and Abroad,
Capable of Decisive Victory
. . . into the 21st Century.*

It is a Journey . . . Not a Destination

THE VISION

America's Army strives to fulfill its vision every day. Our vision is the benchmark of all that we do, but it serves its most important function as our azimuth to the future. Even in the midst of profound and sweeping change, it brings us back to the central reason for our Army's existence. Continual change is required to realize this vision, and it inspires us to master change and exploit its potential.

Since the end of the Cold War, our Army has performed magnificently again and again while absorbing profound reductions and undertaking massive restructuring. We have already accomplished a tremendous amount of physical change to become a versatile, flexible, Power Projection Army. We are a different Army than we were just five years ago. But getting smaller, relocating, and reorganizing does not by itself ensure victory on tomorrow's battlefields.

The power of the Army's vision is that it guides us into the 21st Century. Recognizing that the vision has embedded forces for change, we have initiated a campaign to evaluate new experiments that will leverage superior American technology to build the Army of tomorrow: *Force XXI.*

"I will tell you, we are using every means available to us to project ourselves into the future ... we are reading everything we can about the world in the 21st century. And then we are trying to create the worlds of the 21st century and force ourselves into the 21st century."
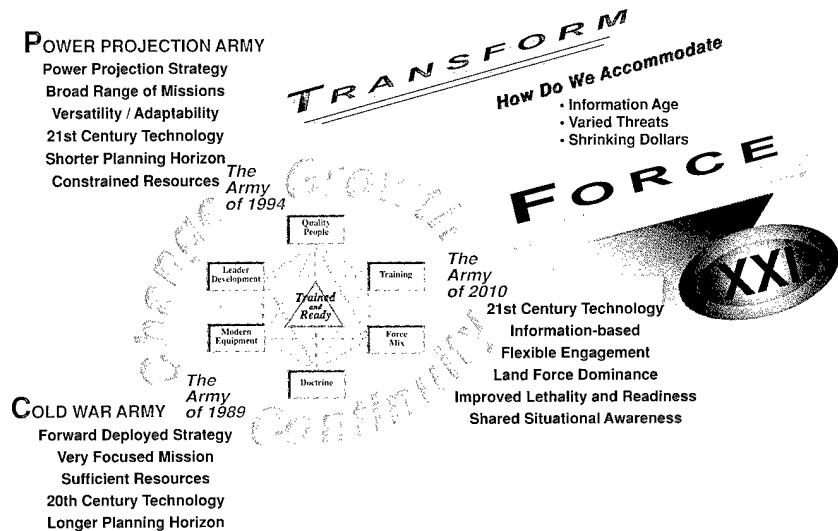General Gordon R. Sullivan

We are now entering a critical stage of that campaign: the work of redesigning the force. This work has been left undone up to this point because it was necessary to allow the turbulence to abate and uncertainty to settle, to learn more about the future environment and "what could be," and to set in place the intellectual foundations of change. Our new doctrine, concepts, and processes are in place and provide the foundation for the redesign of the force. These new ideas help us to better leverage the power of our soldiers and leaders, the power of our technology, and the synergy of joint operations.

America's armed forces face a unique challenge. They must respond to the forces that will transform the nature of the next war before that war begins. As we study the history of the various services in many countries over the centuries, we note that a key prerequisite to such change is an intellectual atmosphere favoring the notion of change. When that exists, the change itself will be seen in doctrinal concepts, organizational structure, and the technology of the tools of war. Some of these changes apply directly to combat. Others take place far from the fighting front but enable combatants to achieve decisive victory. The Army's understanding of these fundamentals was a key factor in the renaissance after the Vietnam War. We have maintained the necessary intellectual atmosphere favoring change, we have used it to modify our doctrine, and we are now conducting the experiments that will transform organizational structure and the tools employed in that structure.

POWER PROJECTION ARMY
- Power Projection Strategy
- Broad Range of Missions
- Versatility / Adaptability
- 21st Century Technology
- Shorter Planning Horizon
- Constrained Resources

The Army of 1994

TRANSFORM

How Do We Accommodate
- Information Age
- Varied Threats
- Shrinking Dollars

FORCE

The Army of 2010
- 21st Century Technology
- Information-based
- Flexible Engagement
- Land Force Dominance
- Improved Lethality and Readiness
- Shared Situational Awareness

The Army of 1989

COLD WAR ARMY
- Forward Deployed Strategy
- Very Focused Mission
- Sufficient Resources
- 20th Century Technology
- Longer Planning Horizon

Quality People • Leader Development • Training • Trained and Ready • Modern Equipment • Force Mix • Doctrine

---

"With both Louisiana Maneuvers and Battle Labs, the Army has created the means for the organization to see and experience for itself how it could learn from itself and change. Important initial conditions for experimentation and learning, and the means for broad involvement have been created. The inspiration for continued change comes not from the leadership, but from the successes that are occurring in many places around the organization. In this way, the organization provides its own inspiration, and also establishes its own pace of change. People learn what is possible by listening to the experiences of their peers, rather than the inspiring words of their leaders. As they are able to reference more and more of these stories, the organization changes its beliefs about itself. It comes to know itself as capable of change, even in an organization as tradition and policy-bound as the US Army."

- Dr. Margaret J. Wheatley-
President of the Berkana Institute and a principal in
Kellner-Rogers & Wheatley

These roles for Army forces will endure. We will be required to **compel** those who fight us to accede to our will, **deter** those who might oppose us from taking actions inimical to our interests, and **reassure** our allies by conducting those forward presence and peace operations that promote world stability and the betterment of mankind. And, America can count on the Army to **support** at home. Hurricane relief operations in Florida and Hawaii, and fire fighting in the West are recent examples. It is our collective responsibility as Americans to ensure that we create the most effective and efficient Army that we can — one that always allows us to operate from a position of national strength and competently accomplish all four purposes.

Compel – Gulf War

Reassure – Rwanda

Deter – Korea

We live in a volatile, uncertain, chaotic, and ambiguous world that demands a force capable of performing missions across the full spectrum of conflict and operations other than war. As the world continues to change at an accelerated pace, we need an Army that is not only versatile and responsive, but one that can adapt effectively to that changing world.

Sometimes, the protection of our national interests will involve the use of force to compel the enemy to do our will. At other times, the threat of force will be sufficient to influence international events favorably. On still other occasions, we will be required to conduct humanitarian or peace operations to reassure our neighbors and allies around the world. On most occasions, we will conduct these operations as part of a joint or combined force.

Support – Florida

What Is Force XXI?

Force XXI is the transformed Army of the 21st Century— in its entirety. The central and essential feature of this Army will be its ability to exploit information. Information and digital technologies are creating such a synergistic effect among all the operating systems, organizations, and components that the Army's capability will be enhanced by an order of magnitude. Tomorrow's Army will embody all Force XXI objectives.
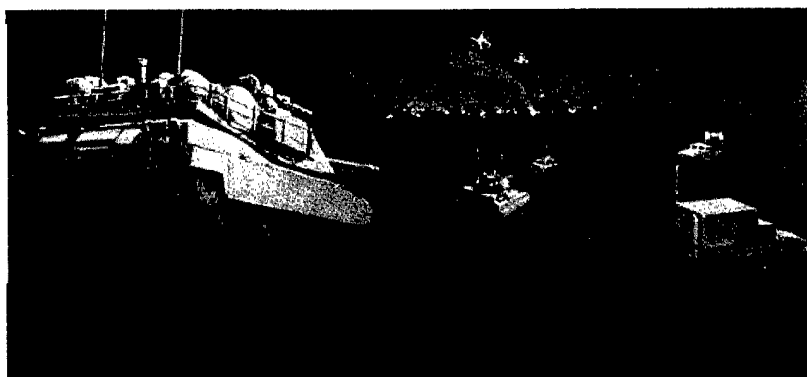
Dominate Maneuver

Technology of the 21st Century will demand a 21st Century soldier equal to the sophisticated systems of the future. Only intelligent, physically fit, highly motivated, educated, and well-trained soldiers can leverage technology to its full potential. Soldiers will be the most important element of Force XXI, for it is through quality soldiers that the full power of technology will be realized. Technology will further leverage their power through advanced training technology employing state-of-the-art simulations and training devices.

Electronic connectivity between and among all echelons in the Army will result in such speed and precision in communication that the entire organization's situational awareness and agility will far exceed that of today's forces. This greatly enhanced connectivity, speed, precision, and agility will result in significantly improved lethality, survivability, tempo, versatility, sustainability, and deployability in the force — in short, a *better* Army.
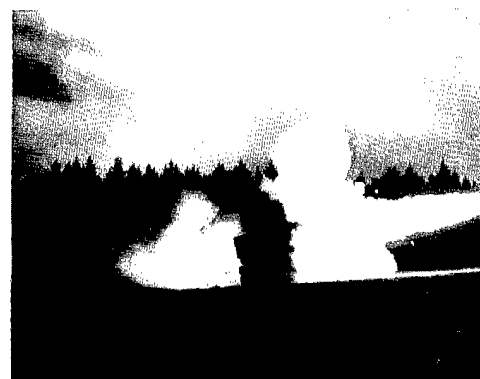
Conduct Precision Strike

It is more useful and accurate to envision this Army as a succession of qualitatively improved versions than as a single, fixed entity. Each successive version on this continuum will be linked and interoperable with its predecessor, but will have enhancements and improvements that make it better. This continuum of transformation will be the result of a focused, well-designed process leading to an Army that continuously learns, improves, and changes through experimentation and operational experience.
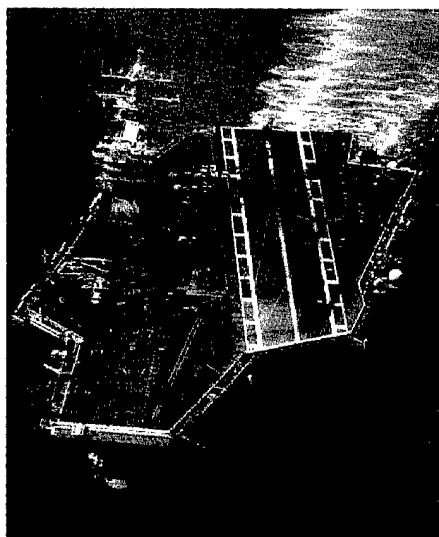
Protect

Win the
Information War

XXI Objectives:
NS of Excellence

... and Sustain

Project ...

We began a series of simulations and exercises in 1992 called Louisiana Maneuvers (LAM). The process used by the Army's senior leaders to direct innovation within LAM has given the Army a new way to anticipate and adapt to our changing environment. Force XXI will be the result of this process and emerging support activities.

Force XXI will be ideally suited for joint operations and will be fully compatible with the operational systems of the other services. Seamless information connectivity with the other elements of the joint force will be its primary characteristic and is essential for the success of joint operations.

Because Force XXI will be modular in nature, we can easily tailor the necessary force package to meet the needs of a joint force commander. This modularity will allow us to generate, project, and sustain force packages for any type of military operations.

Why Force XXI Now?

While we must accommodate the real world constraints of a decreasing budget and a related reduction in manpower, they are not the most important reasons for our aggressive move toward Force XXI now. The most powerful argument for the development of Force XXI is the quantum leap in capability it will give us. It will make us better. Force XXI will put the best capabilities America can provide in the hands of our sons and daughters before we send them in harm's way, and it will institutionalize our qualitative advantage.

Not only will we be able to generate greater combat power with a given force, but we will have the inherent organizational agility and versatility to respond to the increasingly broader range of missions our Nation requires us to perform, often on very short notice. The accompanying map illustrates vividly the variety and number of missions we have been called upon to perform in the last four years.

As we saw with Iraq and are now seeing in any number of other countries, a state that does not challenge us today could, within a few years, seriously threaten our strategic interests or those of our allies. We are only the eighth largest Army in the world. Several nations in the top seven either give us concern presently or have worked against our interests in the recent past. Still others pose threats to each other that could affect our interests in the region. In addition there are non-state organizations, such as terrorist groups, drug cartels, and armed factions in disintegrating societies, whose acquisition of high technology weapons and equipment also poses a potential threat to our interests. James Woolsey, Director of the Central Intelligence Agency, sums up this point succinctly:

"Yes, we have slain a large dragon. But we live now in a jungle filled with a bewildering variety of poisonous snakes. And in many ways, the dragon was easier to keep track of."

To secure America, we have become a Power Projection Army. The bulk of our forces are now located in the United States. As our permanent overseas presence continues to decline, we will increasingly have to rely on our forces based in the United States to respond to contingencies around the world.

Nevertheless, all our forces — both in the U.S. and overseas — are being called on today to deploy to other lands. This trend promises to continue well into the 21st Century. The missions we receive today cause us to reconfigure and tailor our forces. This "task organization" is an inherent Army capability that we are enhancing by creating more modular

ANDREW

TASK FORCE 64

Brigade/Group C2
Engineers
Transportation
Food, Water, Laundry
"Force Provider"

CONUSA C2
Engineers
Civil-Military
Light Infantry
Deployed/Re
  Infrastructu

JUST CAUSE

Theater C2
Airborne/Air Assault
Light/Mech Infantry
Ranger/SOF
Military Police
Civil-Military
Theater Infrastructure

SUPP

EUCC
SOF/L
ROWI
Engin
"Line
Deplo

Compel
Deter
Reassure
Support

A Menu of

forces that can be more readily reconfigured for a wide variety of missions. We must be able to generate an effective, decisive force from diverse elements without undermining the capability of the units that stay behind. This is an absolute requirement, for these stay-behind units themselves must be ready to deploy when called.

Force XXI will be a more resource-efficient Army, with capabilities enhanced through information age technologies. It will allow us to project power into any area of the world more quickly, more effectively, and with greater efficiency as part of a joint effort. America needs this force and we are moving out now to make it a reality.

Uphold Democracy

Army/Corps C2
Airborne
Light/Mech Infantry
    /Armor /Aviation
Ranger/SOF
Military Police
Civil Affairs
Deployed
aired   Infrastructure
e

Provide Comfort

EUCOM C2
Aviation
SOF/Civil Affairs
Hospital
Created Infrastructure

Korea

Theater C2
Hybrid Division
Patriot
Theater Infrastructure

Restore Hope

Coalition C2
Aviation Brigade C2
Light/Mech/Armor
Ranger/SOF
Civil Affairs
Military Police
Deployed/Created
    Infrastructure

Desert Storm

Army/Corps C2
Mech/Armor/Aviation
Air Assault
Patriot
MLRS/ATACMS
Deployed/Host Nation
    Infrastructure

RT HOPE

C2
ght Infantry
Us
ers
acker ships"
ed Infrastructure

Capabilities for Decisive Victory

9

What Is the Critical Challenge of Force XXI?

The critical challenge for the Army as we create Force XXI is to *remain trained and ready, while growing more capable.* President Clinton brings this challenge into clear focus:
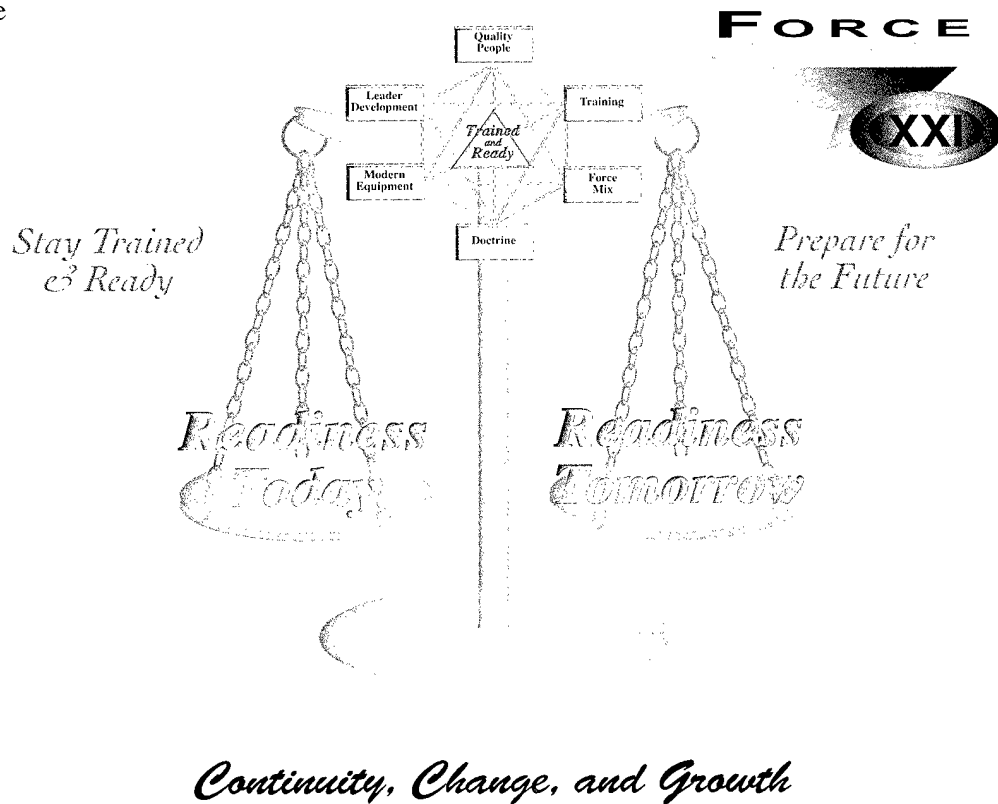
"You will be called upon in many ways in this new era to keep the peace, to relieve suffering, to help teach officers from new democracies in the ways of a democratic army and still ... to win our wars."

The message is clear: We can take no time outs from readiness as we create a new force designed for 21st Century challenges. Thus, our objective is to balance the competing resource and operational demands of today with the need to grow the force for tomorrow. Keeping our institutional imperatives in proper balance allows us to stay trained and ready. To achieve Force XXI, we must **change** our outmoded ways, retain **continuity** of our essential Army values, and promote **growth** of our capabilities to achieve decisive victory for the Nation.

Once an organization creates its vision of the future, it must have a plan to realize that vision. The plan must balance the organization's ongoing operational requirements with its developmental needs — it must operate today and grow tomorrow. Our plan is the Force XXI Campaign Plan, and we are implementing it today. The central element of the plan is a structured and disciplined experimental process that enables very sophisticated discovery learning. Together, our Campaign Plan and our experimental methodology give us a means to explore new ideas, hypothesize, experiment, review, and decide.

"...Balance is the key word. It really describes the challenge we face in the Army today."

General Dennis J. Reimer

Stay Trained & Ready

FORCE XXI

Prepare for the Future

Readiness Today

Readiness Tomorrow

Continuity, Change, and Growth

The Force XXI Campaign Plan

The Campaign Plan provides both the intellectual construct and the key decision points to achieve Force XXI. It is guiding the Army in the design of the 21st Century force and will discipline us to make fielding and related support decisions by the year 2000. This time line will enable us to field a Total Army Force that meets the Nation's needs in the first decade of the next century. Executing this plan is a

will be the initial focus of Joint Venture. Producing the best possible operating force will be its goal.

The second and supporting effort is the reinvention of the Institutional Army, that part of the Army that generates and sustains the operating forces. Like Joint Venture, this effort also cuts across all of the major commands and the Army Staff. The Vice Chief of Staff of the Army supervises this portion of the plan using the Deputy Chief of Staff for Operations and Plans as the executive agent.

FORCE
XXI

TDA / INSTITUTIONAL

JOINT VENTURE

ADO
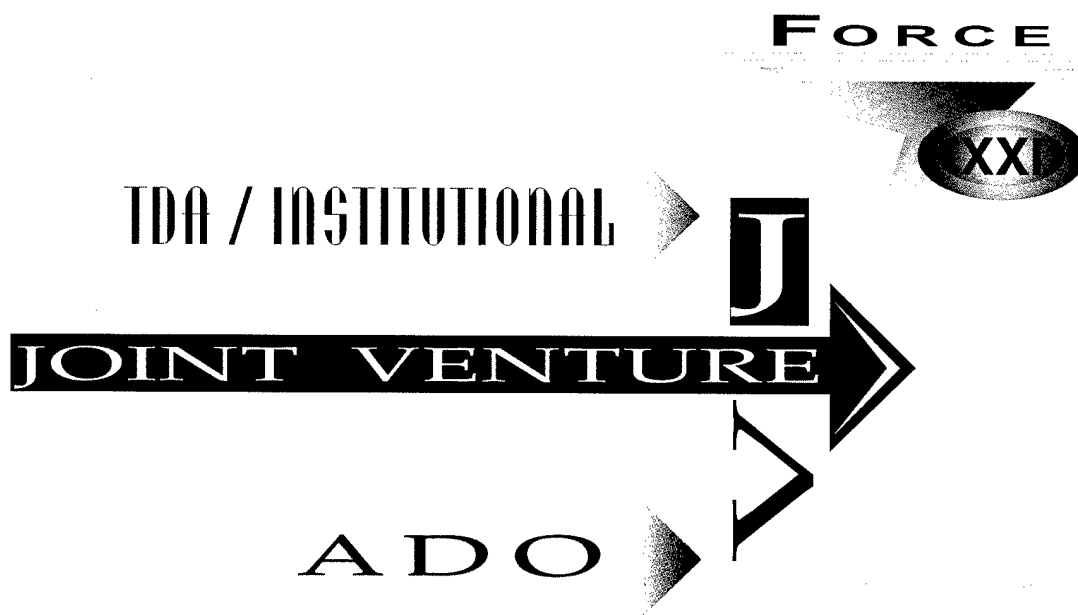
team effort for the entire Army, cutting across all organizational boundaries. We use the Louisiana Maneuvers (LAM) process to synchronize this team effort.

The Force XXI Campaign Plan incorporates three complementary and interactive efforts. The first and most important effort is focused on the redesign of Army operational forces. We call this effort "Joint Venture." Joint Venture is a partnership between all the major commands and the Army Staff, but the Commander of U.S. Army Training and Doctrine Command has the responsibility for overseeing and coordinating this effort. Reengineering the division

The third part of the Campaign Plan concentrates on the development and acquisition of information-age technologies, particularly our digital communications hardware and the related software needed for information-age battle command. Led by the Director of the Army Digitization Office (ADO), this endeavor supports the other two by ensuring that we field information-age technologies horizontally across the force in a synchronized manner.

An interactive and linked series of Advanced Warfighting Experiments (AWE), Advanced Technology Demonstrations (ATD), Advanced Concept Technology Demonstrations (ACTD), and Advanced

Concepts and Technology II (ACT II) programs mark the major milestones in this process by providing insights into the critical decisions the Army must make about the future organizations, equipment, training, and doctrine. Conducted in a series of progressive cycles, these experiments and demonstrations will provide insight for interim design decisions and help to design future experiments. They will also help the Army's leadership to make informed and timely resource decisions to synchronize the fielding of this new force with Department of Defense plans.

For clarity of purpose and ease of planning, the campaign is divided into three intermediate phases, each culminating with an experimental objective. Each of these three phases is primarily focused on an echelon of the Operational Army, but concurrent exercises, experiments, and demonstrations for the other two echelons will be ongoing. The AWEs, ATDs, ACTDs and ACT II programs are divided among the three phases. The first phase concentrates on the brigade, the second on the division, and the third on the corps. Completion of the final phase will enable us to make our Force XXI implementation decisions, but the process will continue as we seek new and better ways to acquire and assimilate advanced technologies to give our quality soldiers a 21st Century edge.

"Defense contractors are being asked to join into a new partnership ... for the first time a true partnership where there is sharing of risks and rewards."

Daniel Burrus

Advanced Warfighting Experiment (AWE)

DESCRIPTION: AWEs are center-of-gravity culminating efforts focused on a major increase to warfighting capability. They cross many or all of the TRADOC domains of DTLOMS. Moreover, they have an impact on most, if not all, of the battlefield dynamics and battlefield operating systems. Advanced warfighting experiments are approved and prioritized by the CG, TRADOC. There is extensive involvement by HQDA, FORSCOM, AMC, and OPTEC.
EXECUTION:
   •TRADOC responsibility
   • Executed by Battle Labs

Advanced Technology Demonstration (ATD)

DESCRIPTION: A Science and Technology funded, risk-reducing, proof of principle demonstration conducted in an operational environment rather than in a laboratory. Technology developers, systems managers, and Army users develop exit criteria that allows successful technology to transition directly into system improvements or become part of Army Research and Development programs. Performance period is intended to be 3-5 years.
OBJECTIVE: Evaluate technical performance to meet exit criteria.
EXECUTION:
   • SARDA responsibility
   • Executed by Research Development
       and Engineering Centers(RDEC) and
       Program Executive Offices (PEOs)
   • Must support a Battle Lab Experiment or AWE

Advanced Concept Technology Demonstration (ACTD)

DESCRIPTION: Mechanism for intense user involvement in technology assessment and insertion into warfighting systems. Performance period may be multi-phased and extend beyond 5 years.
OBJECTIVE: Evaluate military utility; develop corresponding concepts and doctrine; residual operational capability.
EXECUTION:
   • OSD responsibility
   • Executed by the Services

Advanced Concept Technology II Program (ACT II)

DESCRIPTION: Technology program designed to demonstrate proof of principle, high-risk/high-return concepts proposed by industry and academia to support Battle Lab experiments and AWEs. Successful technology can transition directly to end items or become part of Army Research and Development programs. Performance period is intended to be 12 months or less.
OBJECTIVE: Encourage application of new technology not currently available in Army programs.
EXECUTION:
   • SARDA responsibility
   • Proposals solicited by Army Research Office and
       selected by ACT II Committee
   • Executed by RDECs, Army Laboratories,
       and Battle Labs

WHAT HAVE WE LEARNED?

We have completed our transformation from a Cold War Army focused on the Soviet threat to a Power Projection Army based primarily in the United States. In accomplishing this enormous and very important transformation, we have built a strong and enduring bridge to the future. In what has become a process of continuous change, today's Power Projection Army is a milestone on our way to Force XXI.

The Army has achieved a remarkable degree of consensus on the need to change ... and the need to create an Army for the 21st Century organized around information technology. What have we learned during the early years of our transformation to a Power Projection Army that will guide us into the 21st Century? The answer is quite a lot. The enormous amount of work we have done thus far helps us to answer this central and critical question: *How does the Army remain trained and ready to meet the needs of the Nation, growing more capable while it gets smaller?*

How does the Army remain trained and ready to meet the needs of the Nation, growing more capable while it gets smaller?

- **New Doctrine and Concepts**
- **New Processes**
- **Modernization and Digital Technologies**
- **Distributed Interactive Simulations**
- **Space-Based Systems**
- **Integration of Experiments with Training**
- **General Headquarters Exercises**

New Doctrine and Concepts

Innovative doctrine for the 21st Century changes how we think, then what we do, and ultimately what we are. In this regard, we are aggressively developing new doctrine and revising existing manuals in light of the new environmental realities. Last year we significantly updated our keystone warfighting text, Field Manual 100-5, *Operations*. Its publication marked the adoption of a doctrine of full-dimensional operations. Not only did it stress the principles we need to learn and understand to maintain the edge in future theaters of war, but it also showed how the art of battle command applies to those principles in various scenarios. This doctrine is a profound shift from the narrower, more deterministic approach of the Cold War, with its focus on Central Europe.

More recently, we released Training and Doctrine Command Pamphlet 525-5, *Force XXI Operations*. It provides us with the intellectual "next step" for our doctrine. The precursor of the 21st Century edition of Field Manual 100-5, *Operations*, it provides the conceptual framework for changing the Army from a power projection force to an information age, full-dimensional force of the 21st Century. We know that the strength of our Army of the future will rest on its ability to master information operations, and *Force XXI Operations* explores the impact of information age technologies on the operational environment of the future. It also gives provocative insights into the critical battle dynamics we should exploit to remain the most powerful Army on earth. Most importantly, *Force XXI Operations* provides an azimuth for a quantum leap in Army operations on the joint battlefield.
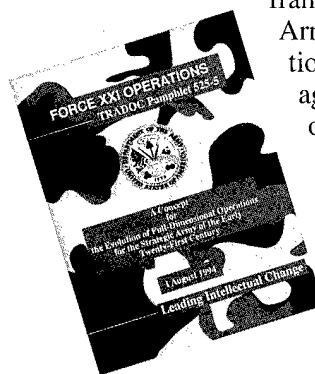
"... it is ideas that lead change for the Army. Ideas expressed in a coherent concept lead to experiments and discovery of needed change, resulting in improved results in both War and Operations Other Than War."

General Frederick M. Franks, Jr.

through procurement. Using revolutionary advances in simulation technology, such as virtual reality and virtual prototyping, these integrated laboratories are experimenting with new technologies and warfighting ideas to discover emerging battlefield opportunities. The Battle Labs provide unique test beds for the major Force XXI experiments.

New Processes

To translate intellectual change into reality, the Army created Louisiana Maneuvers (LAM) and Battle Labs to change the way we change. LAM and Battle Labs enable us to challenge Cold War-driven decision processes and move the Army forward more quickly and readily.

Now entering its third year, the LAM process has become institutionalized as a means for the Army's leadership to think about the future, taking charge of the process of change. In the broadest sense, LAM does four things. First, it provides a mechanism for the Army's leadership to identify the most important new ideas and questions we need to resolve. Second, it establishes the basis for reaching consensus among the leadership. Third, using a wide range of investigative tools, it causes those new ideas to be studied. Fourth, LAM provides accelerated feedback to the Army's leadership, providing strategic agility in decision making.

As it has matured, the LAM process has enabled us to see the necessity for Force XXI in its broadest and most holistic sense. Therefore, LAM will coordinate and synchronize the development of Force XXI while keeping the leadership focused on the critical issues for change. LAM plays a central role in fostering innovation and resource allocation throughout the Army.

Battle Labs provide a seamless link between users and developers from concept to development

Modernization and Digital Technologies

One method of increasing capabilities in the force is to improve equipment already in the field. We will accomplish this through the application of advanced information-age technologies across existing weapons systems. By enhancing the information component of these families of systems, this program — known as horizontal technology insertion — will produce synergistic effects in equipment capability, performance, and overall combat power. As an example, in our experiment at Fort Irwin earlier this year, we demonstrated that the digitization of an armored task force could improve its lethality and survivability significantly. Horizontal technology integration across today's weapons systems is a cost-effective means to achieve the five Force XXI objectives and dominate the 21st Century battlefield.

The second and more critical step is to make the complete transformation to an information-based

Army. Such a transition requires that we make fundamental changes in how we gather, analyze, distribute, and act on information. As we move from analog systems to digital systems, we will begin to leverage the power of the microprocessor — the power not only to move massive amounts of data, but more importantly, to communicate concepts and battlefield awareness across the entire Army. We have already begun designing weapons and intelligence systems around digital technology. These systems include the Comanche helicopter, the Advanced Field Artillery System, and the All Source Analysis System. These are but a few of the rapidly expanding list of systems predicated on information-age technology.

variations. If we can conceive an option, we can simulate it.

When we speak of simulations, we classify them into three categories. The first category is live simulations — those conducted with real equipment and soldiers in an actual training environment that replicates combat conditions. Our training rotations at the National Training Center are classic examples of live simulations.

Virtual simulations comprise the second category. Typically, these simulations are conducted with electronic mock-ups of real weapons systems. These mock-ups use computers to replicate on-board systems and the external combat environment. Flight and tank gunnery simulators are representative of these kinds of simulations.

Distributed Interactive Simulations

When the Army was forced to rely on large scale maneuvers for force development experiments, we could only look at what existed and use imagination for the rest. Now, the Army can use modern simulation systems to look at today, tomorrow, and the day after. The microprocessor gives the power to simulate systems that do not exist yet, to replicate what we do have, and to run them in scenarios over and over, in many
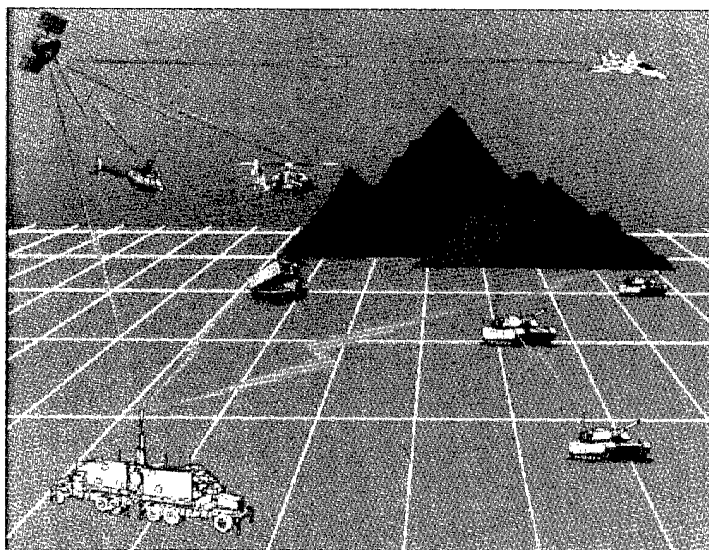
"Our challenge is to ensure that we understand what a great organization we have. And we figure out how we can translate that great organization into an even greater organization for tomorrow."

Lieutenant General Paul E. Blackwell
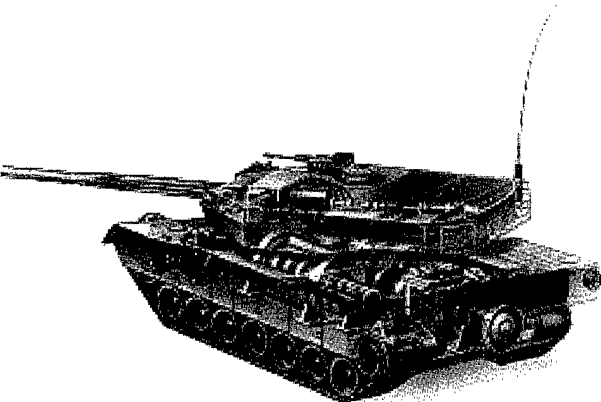
The final category consists of constructive simulations. These simulations replicate warfare in the form of computer modeled war games. In some constructive simulations, the computer presents the participants with a graphical portrayal of the operational situation and allows them to make decisions to influence the situation. We most commonly use models that allow us to war game against a competent and active opponent. Others simulations run independently of human interaction once initial parameters and data are established.

All three forms of simulation have proven to be extremely effective training and development tools. They provide us with a rich variety of scenarios and give us a means to tailor training and development to the appropriate level. Today, we use simulations routinely and we are beginning to develop and combine them in new and important ways.

One of the Army's most exciting and promising initiatives in this regard is the Synthetic Theater of War (STOW). STOW is a joint experiment between the Army and the Advanced Research Projects Agency (ARPA) to demonstrate the dynamic environment created through the sharing of distributed, interactive simulations. It creates a fully integrated joint theater of war through the interactive communication between virtual, live, and constructive simulations in real time. Soldiers in all three training environments share a common, relevant picture of the battlefield and they interact seamlessly.

With STOW, a unit can work at its own local training facility and yet be linked digitally to other units and a command and staff organization located far away. One unit could be in tank simulators tied together in a unit network and operating in a virtual environment. Another unit on one flank might be a real tank battalion at the National Training Center while the other flank unit and the enemy would be replicated by a computer simulation. Further, Navy and Air Force units can seamlessly integrate into the simulated battlefield along with logistics play.

All of these forces — live, virtual, and constructive — are "mutually visible" to each other on computers in real time and are displayed on situation maps at command posts across the "battlefield." The result is realistic training at all levels between actual units on the ground and units simulated on the computer. At the end of an exercise, there is little or no maneuver damage, minimal environmental effects, low maintenance costs, and little travel time. A further benefit is that we can capture all actions and events in the exercise in computer files for playback and for after action reviews. We can share these learning experiences over and over. Most importantly, though, STOW allows us to exercise a level of joint operations never before achievable in our exercises and simulations.

STOW is a maturing concept that we have already employed at our Command and General Staff College at Fort Leavenworth and in Europe to support the CINCEUR/SACEUR annual Atlantic Resolve exercise. STOW affords the Army greater realism in theater exercises, enhanced performance through mission rehearsal, better decision making through computer-aided wargaming, improved leader development, and applications to industry, all at less cost. STOW will play an integral role in our Force XXI experimentation plans.

STOW
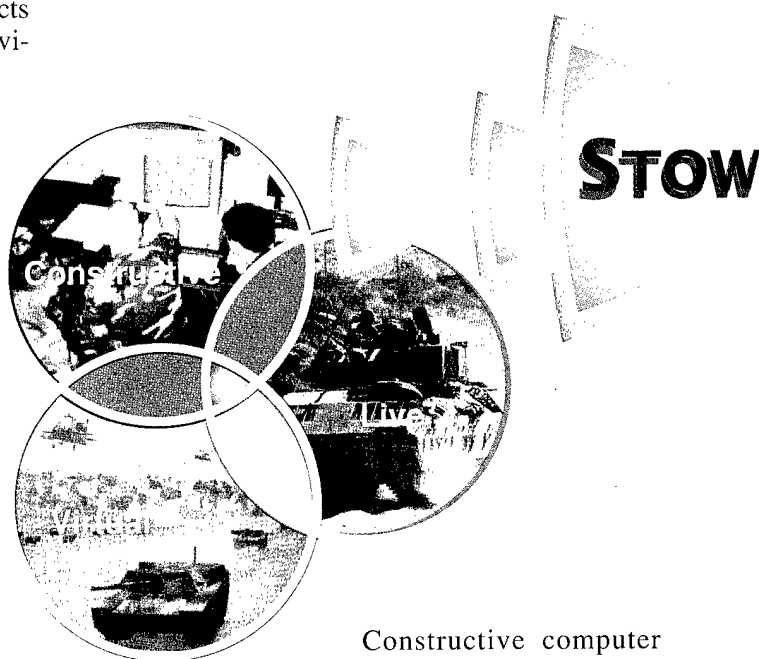
Constructive computer simulation gives us the ability to model potential future forces and then test these models in interactive, competitive war games. In the past year, we conducted an important simulation of this type. It explored the warfighting potential of a hypothetical future force organized around information and digital technology. Named Prairie Warrior '94, this exercise evaluated information-based battle command and the design of an innovative organiza-

tion, the Mobile Strike Force (MSF), derived from the war-fighting concepts put forth in *Force XXI Operations*. Students at the Army Command and General Staff College served as the staff of this 21st Century force and fought it against corps-sized enemy formations featuring a professional and competent opposing force.

Weapons Systems			
M1A2	259	AH-64D	54
M2A3	232	RAH-66	18
LOSAT	48	AH-58D	40
NLOS	24	BSFV	24
M109A6	48	Avenger	36
MLRS	27	Javelin	228

The central feature of the MSF was its organization around digital information technology. We designed it with an advanced capability to acquire, process, distribute, and most importantly, use information to gain an operational advantage over an enemy. Digitization of data links and enhanced voice communications across the entire force provided it with an information connectivity that surpasses anything we possess today or will be available in the immediate future. Domination of information warfare, we hypothesized, would result in a significant improvement in the MSF's ability to fight effectively.

Through this simulation, we saw clear gains in the fighting effectiveness of netted and digitized forces. We demonstrated that modernized information operations improve the commander's ability to synchronize operations in his battle space. The MSF commander's situational awareness and the staff's shared picture of the battle allowed the commander to make more accurate and rapid decisions than non-digitized counterparts. Throughout the exercise his view of the battle space was more accurate and timely than the non-digitized corps for which he worked. As a result, the MSF proved to be as lethal as larger, existing forces even though it possessed fewer major weapons systems than current divisions. In short, it could dominate a larger area than today's divisions.

The resultant increases in agility, flexibility, and lethality all stemmed from a clearer and more accurate picture of the battle space and a capacity to take advantage of that picture rapidly. Prairie Warrior '94 clearly demonstrated that digital technology improves the speed and quality of operational decisions. We can anticipate enemy actions rather than merely react to them. These improvements lead to more effective operational units that can operate at a much higher operational tempo than today's forces.
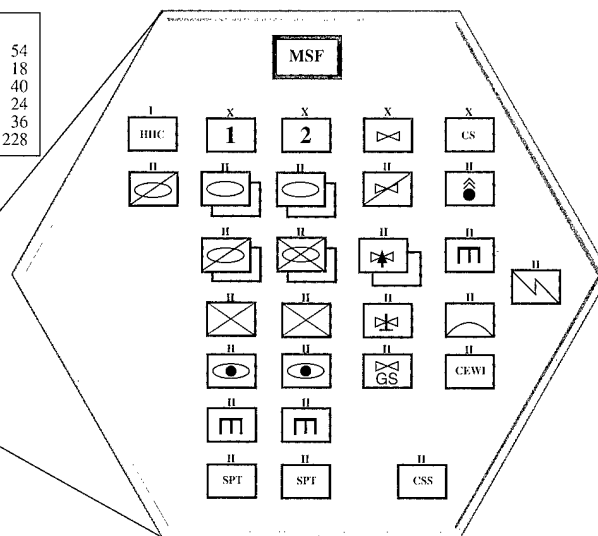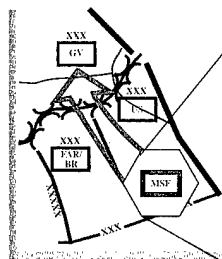
Another promising insight from Prairie Warrior '94 was the value of digital systems in mission rehearsals. Initial observations showed that netted information technologies enabled the MSF staff to conduct a thorough and exacting rehearsal of its deep strike operation. Video teleconferencing, terrain visualization computer graphics, course of action planning software, automated unit status reports, digital mapping, and communications nets allowed aviation, artillery, intelligence, and Air Force elements to understand the operation in minute detail. The results of the deep strike operation speak volumes about the effectiveness of netting and rehearsal. The MSF destroyed twelve battalions of enemy artillery while losing only one helicopter and no fixed-wing aircraft.

Prairie Warrior '94 illuminated issues that warrant further study, training, and experimentation. First and foremost, we saw a clear need to invest more heavily in the computer literacy of the force. Second, we saw an unequivocal demand to experiment much more heavily in the modular design and split-based

"... synthetic theater of war and the training revolution occurring in simulations ... open up all kinds of new opportunities."

General Dennis J. Reimer

operations of our logistics units. Third, we need to explore further the advantages and disadvantages of making the more lethal and deployable forces of the future smaller. Initial results indicate that we may need to experiment further with the resiliency of the

The Effects of Digitization

Tactical Tempo — **Logistical Tempo**

Digitization provided by CSSCS shows a 28% to 95% reduction in the man-hours required for key events along the CSS critical path for supporting the force.

VIC Gaming Shows CSSCS:
- Prevents a delay of operations
- Enables synchronization and improves situational awareness
- Enables force to maintain battle tempo

DIGITIZATION YIELDS:
✓ AGILITY RESULTING FROM MORE RAPID BATTLE COMMAND PROCESSES
✓ LETHALITY/SURVIVABILITY RESULTING FROM INCREASED PACE OF OPERATIONS

force. Fourth, we have yet to understand fully the impact of digital technology on the proper mix between fire support and maneuver elements in the force of the future. Finally, we need to examine how to develop multi-skilled staff officers who can synthesize the vast amount of information available through digital technologies.

The vast power of simulations to improve the force is evident. We already have reaped their benefits in a number of ways and are using the knowledge we have gained from them to improve the effectiveness of the force. The two examples just mentioned are only a taste of what is to come. Simulations will be a central feature of the Force XXI developmental process.

Leveraging the Power of Space-Based Technologies

Recent experience during Operations Desert Storm and Restore Hope demonstrated that the Army of the future will rely increasingly on space-based information systems for command, control, and communi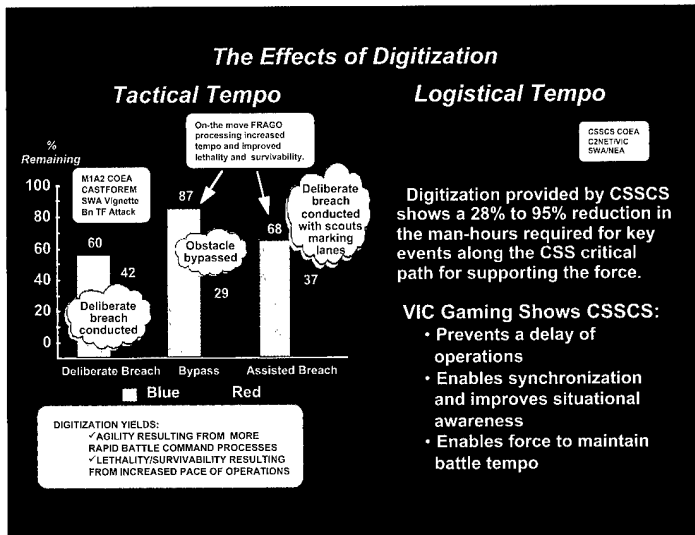cations. Whether we are engaged in combat or providing humanitarian assistance, space-based systems are invaluable to mission accomplishment in a number of ways. First, they provide our forces with responsive communications, position location and navigational assistance, weather data and terrain imaging — especially when we operate in the more remote parts of the world. Further, space-based systems are an important means to link all elements of a joint task force to create synergy in its operations. In addition, space-based systems significantly reduce our communications footprint in the operational theater and are a key component of split-based operations.

We expect to expand the contribution of space-based systems in the future. Multi-spectral imaging data collected by satellite and linked to theater ground stations will put information age terrain and intelligence products in the hands of operational commanders with heretofore unimaginable rapidity. Mission planning rehearsal systems will permit commanders to evaluate courses of action and conduct rehearsals on the "digital terrain" where they will operate. We believe this capability will serve to increase the effectiveness of our operations and reduce significantly the number of American casualties.

The LAM process is making this vision of the future a reality. Recently, the Army's leadership directed the purchase of the Commercial Space Pack-

age, a collection of commercial, off-the-shelf technologies. This package will give us an immediate contingency capability to support operations in areas lacking a developed infrastructure. During fiscal year 1995, the Army will evaluate a technology which uses national space systems to provide detailed tracking of friendly forces. This technology, if procured, will help the Army increase the tempo of its operations and reduce the chances of fratricide at the same time. These two capabilities are representative of what space-based systems research and development can and will give Force XXI.
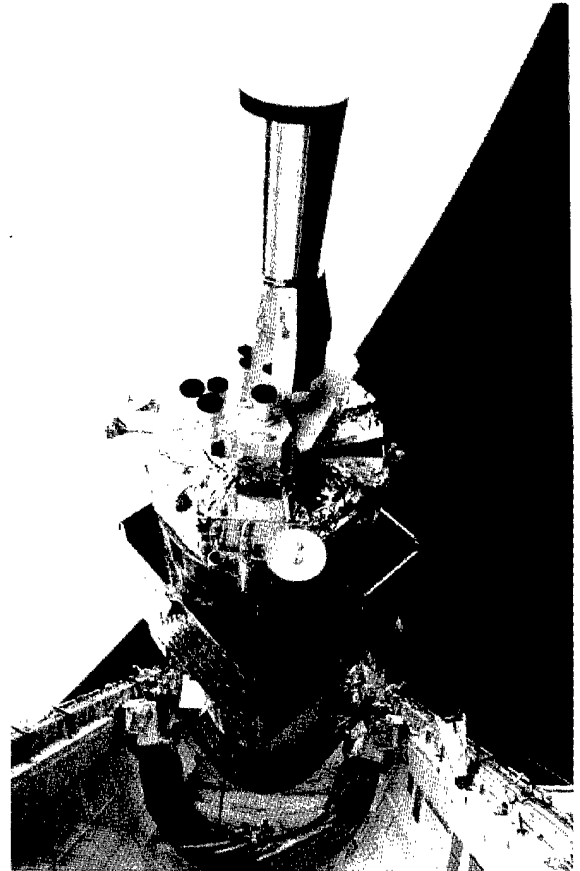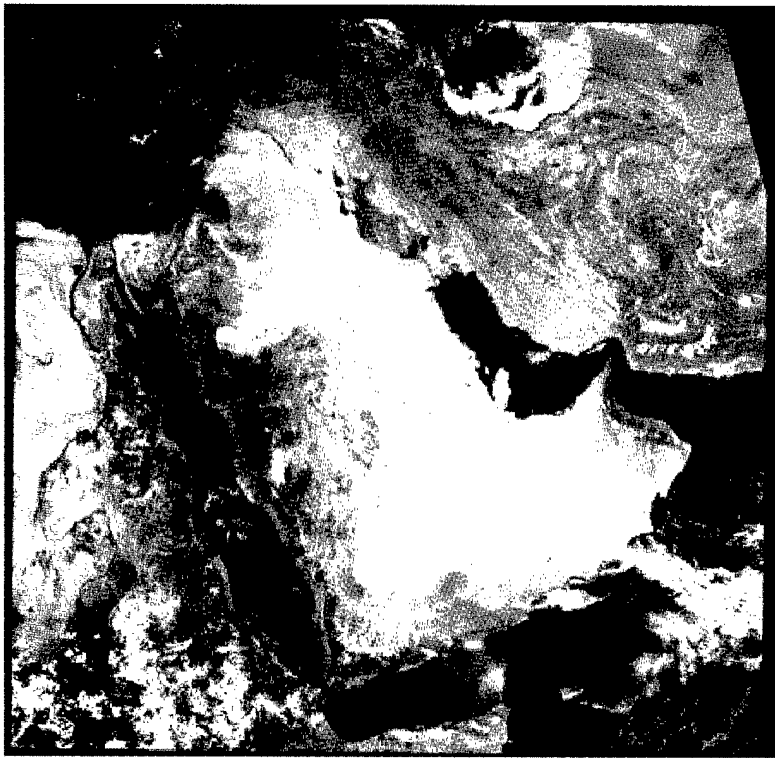
Integration of Technology and Experiments with Training

The most recent example of integrating technology and experiments with training occurred at the National Training Center in April 1994 during an Advanced Warfighting Experiment. In two weeks of intense, force-on-force maneuver and live-fire training, deployed units honed their warfighting and leadership skills in the same manner as other combined arms forces that train throughout the year in the desert environment of Fort Irwin. What was unique about this event was that the training force was linked with digital technology in a tactically competitive environment. Participating units achieved demanding training objectives while simultaneously experimenting with state-of-the-art equipment and technology.

The purpose of the AWE was to test a central hypothesis: **If** you horizontally insert digital electronics into an existing organization using current doctrine and tactics, techniques, and procedures, **then** you will increase lethality, survivability, and tempo across the force. As many developmental items of equipment as possible were provided to gain operational experience with these items. The AWE did more than demonstrate digital communications. It examined information-age tech-

IMPROVED LETHALITY/SURVIVABILITY

Loss Exchange Ratio (Red to Blue)

Ratio (# to 1)

OPFOR Destroyed

Percentage (%)

Comparison of 94-07 Empirical Data against baseline data of 94-05, 94-06, and 94-08

ADA Engagements

Average Engagements

Force XXI Insights

Digitization and improved situational awareness...
•enhances lethality and survivability of the combined arms force
•aids the integration of supporting arms and services

Baseline / 94-07

MTC - Movement to Contact
DIS - Defend in Sector   DA - Deliberate Attack

INCREASED INDIRECT FIRE LETHAL

TF Generated Artillery Missions

Missions Generated

Effective/Suppressiv

Artillery Rounds

Comparison of 94-07 Empirical Data against baseline data of 94-05, 94-06, and 94-08

Effective/Suppressive Mortar Rounds

Mortar Rounds

Force XXI In

Integration of Digital C across the combined a significant increase in lethality

Baseline / 94-07

MTC - Movemer
DIS - Defend in Sector

nologies in an attempt to gain insights on their war-fighting benefits. It was an opportunity to determine where we stood in terms of providing doctrine, training, organizations, and equipment for future combat units. American soldiers learned valuable, difficult lessons about operations at the National Training Center, not on the battlefield.

The AWE also demonstrated the Army's ability to balance the competing demands of maintaining a high level of training

with initiatives to develop the Army of the future. The units were able to achieve demanding training objectives while experimenting with a variety of new equipment and digital systems, providing insights into the future of warfare.

General Headquarters Exercises

Our ability to fight and win the Nation's wars rests on more than the size of the force and modernization. Our future success relies, in large part, on programs that enhance the Army's ability to project and sustain power rapidly, to any part of the world. A ready Army division in the U.S. is of little use unless we can transport it to the fight, sustain it, and reinforce it. Our ability to perform these enabling responsibilities is examined in General Headquarters (GHQ) Exercises.

Insights from these exercises have validated the Army's requirements for the following:

— Airlift, sealift, and prepositioned equipment identified in the Joint Mobility Requirements Study.

— Improved access to the Army National Guard and Army Reserve, and enhanced readiness of Reserve Component units.
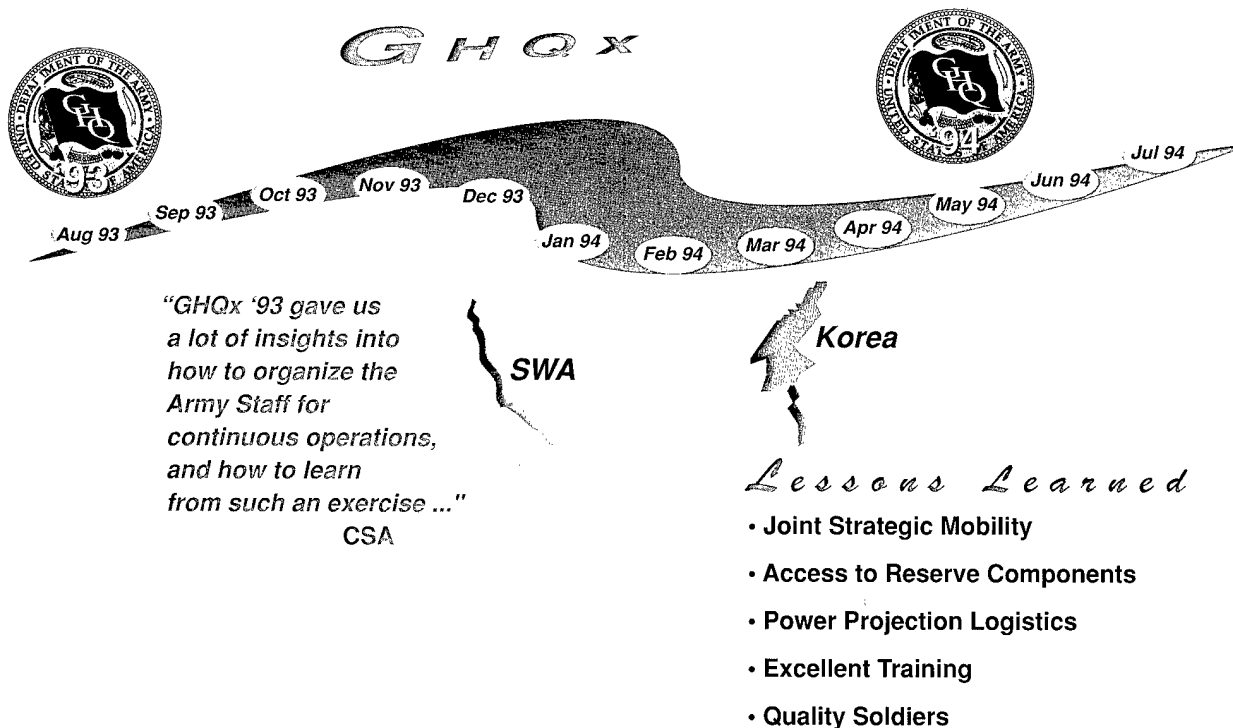
— Capabilities to improve and execute "power projection logistics," and sustaining deployed soldiers from the strategic base in the U.S.

— Continued emphasis on training to the highest possible standards for a wide range of environments, from conventional war to operations other than war.

— Extraordinary soldiers who will continue to successfully meet any chalenge.

– Keeping a highly trained and capable DA civilian force.

The ability to fight and win major regional conflicts comes from more than simply having a force of the correct size with modernized equipment. GHQ exercises help us train and learn at the strategic level to project power and dominate any battlefield.

GHQx

Aug 93 Sep 93 Oct 93 Nov 93 Dec 93 Jan 94 Feb 94 Mar 94 Apr 94 May 94 Jun 94 Jul 94

"GHQx '93 gave us a lot of insights into how to organize the Army Staff for continuous operations, and how to learn from such an exercise ..."
CSA

SWA

Korea

Lessons Learned

• Joint Strategic Mobility

• Access to Reserve Components

• Power Projection Logistics

• Excellent Training

• Quality Soldiers

CSA'S INTENT

We will use a rolling baseline to focus our efforts, and make all key fielding and support decisions for the operating force and our Title 10 functions by the year 2000. Information-age technology for battle command, battle space, depth and simultaneous attack, early entry, and combat service support will underwrite our capabilities to project and sustain the force, dominate maneuver, win the information war, conduct precision strikes, and protect the force across the continuum of military operations.

FORCE XXI
STRATEGIC OBJECTIVE

Transform the force from an Industrial Age Army to a knowledge- and capabilities-based, Power Projection Army capable of land force dominance across the continuum of 21st Century military operations, by leveraging information technology to advantage the Army's quality people, and by redesigning the fighting forces and the Army's sustaining base to better support these forces.

FORCE XXI
Objectives

Dominate
Maneuver

Project & Sustain

Conduct Precision
Strikes

Win the
Information War

Protect the
Force

FORCE XXI
MISSION

The US Army designs the 21st Century force, beginning now, to achieve related fielding and support decisions by the year 2000 in order to fully field the total Army force that is capable of meeting our Nation's 21st Century challenges...from foxhole to factory and front to rear.

FORCE XXI
STRATEGIC GOAL

A force for the 21st Century that is more lethal, survivable, capable of sustained high tempo operations, deployable, versatile and sustainable, and with increased joint and combined connectivity.

WHERE ARE WE GOING?

The Path to Force XXI

What we have described so far has been a prologue for the future. We have accomplished a great deal. We have completed the initial, but crucially important, experiments that form the basis of our future reengineering efforts. What we have already learned and will learn in our future experiments will propel us to the year 2000 and beyond.

As mentioned earlier, our Campaign Plan calls for three separate but complementary efforts that all contribute to the remaking of America's Army. The reengineering of the Operational Army is the centerpiece of this effort, but the redesign of the Institutional Army and the acquisition of information-age technologies are important supporting initiatives that must succeed.

As we move forward on the path to Force XXI, the center of gravity for our experimentation is the redesign of the operating forces. We have learned from our experiences of the past two years that "organizing around information" means that we must redesign our operating forces around three broad interconnected organizational functions:

- How we fight.
- How we organize.
- How we command.

How we **fight** addresses the doctrine, tactics, techniques, and procedures for information-based operations in the 21st Century. How we **organize** concerns the combinations of combat, combat support, and combat service support elements at each echelon required to dominate and increase battle space with fewer forces. How we **command** addresses the processes required to exercise the art and science of battle command to create, fight, and maintain high performance units.

The first of our two supporting efforts focuses on reengineering the Institutional Army. We have learned much about where we need to go from the General Headquarters Exercise series and other initiatives. We know that the design of our Institutional Army must be based around the twenty basic functions it performs. These Title 10, U. S. Code, responsibilities are grouped into four general categories:

- How we create the force.
- How we generate the force.
- How we sustain the force.
- How we structure the force.

How we **create** the force addresses, at a minimum, how we recruit, train, organize, mobilize, and equip our forces. This process prepares our soldiers to join the operating force as competent, well-trained, and contributing members of cohesive units. It ensures that we prepare the force in the right mix of Active and Reserve Components and that they are all appropriately prepared for their assigned operational missions. It produces a Total Army that is genuinely seamless in its capabilities and performance.
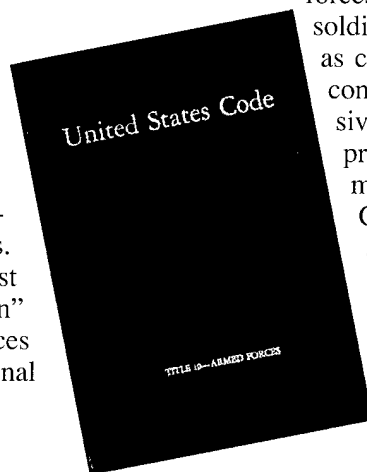
How we **generate** forces encompasses the rapid projection of a competent fighting force into a theater of operations, the proper mix of that force, and the proper metering of remaining force packages into the theater as they are needed. Key to successful force generation is our ongoing ability to provide the proper mix of capabilities to the operational theater, using strategic mobility assets, properly realign the mix of our remaining force for other potential contingencies, and still respond to our day-to-day missions. Critical in this process is the organization of the Army and having the appropriate units — both Active and Reserve Components — for the assigned and potential missions. Successfully generating the force is also dependent upon the partnership of the other services for success. It requires us to work joint procedures, policies, and plans with them to ensure success.

23

How we **sustain** the force centers on maintaining the Total Force's readiness before and after deployment. This category of functions has two thrusts. The first focuses on the collective training readiness of the force, both before employment and upon recovering from redeployment. The second thrust centers on our efficiently supplying, servicing, maintaining, and administering the force — before, during, and after employment. This thrust also includes health care services, law enforcement activities, base operations, and construction initiatives. All of these functions collectively ensure that the force is continuously prepared to go anywhere, anytime to accomplish its assigned mission.

How we **structure** the force concerns our responsibilities to organize forces adaptable to rapidly changing contingencies and with the proper balance of combat, combat support, and combat service support units to support joint operational plans. We must have enough of the right kinds of units in the deployed force and at the same time have the overarching force structure to ensure that deploying units and the strategic reserve get the institutional support they need.

Fundamental to the success of the two efforts mentioned above is the achievement of a seamless and holistic information architecture. In this regard, the Army Digitization Office (ADO) serves as the "enabler" for the Institutional and Operational Armies by overseeing and coordinating these functions:

- How we establish an architecture to develop and field information-related technology rapidly.

- How we streamline acquisition of information-related technology to better integrate the collective efforts of both the Army and industry.

How we establish the architecture to field information-related technology concerns our ongoing effort to build an integrated digital system, first for the battlefield and later for the Army as a whole. This holistic, digital battlefield system must be designed so that each of its component parts can "talk" to each other in a way that is virtually invisible to the user. To achieve this goal we will need to integrate existing systems with new technological developments and commercial off-the-shelf technology. Our vision is to develop open, standard architectures compatible and completely interoperable with suc-

ceeding versions and other systems. Inherent in this process is the need to promote a more timely, responsive, focused, and agile developmental system that addresses the needs of the user.

How we streamline acquisition to better integrate the combined efforts of the Army and industry revolves around our ability to develop a more symbiotic relationship with our commercial partners in the development of digital systems. To accomplish this goal, we must invite and encourage industry to live the developmental cycle with us in a closer and more interactive way than we have in the past. Implicit in this relationship will be industry's intimate participation in ongoing testing and membership in developmental and operational testing teams. The key idea here is to expedite developmental and operational testing and at the same time produce digital products that answer the Army's needs. Also important in this faster developmental process will be our increasing exploitation of state-of-the art commercial technology that we can rapidly adapt to military use.

The preceding discussion provides each of our three main efforts with a conceptual context. Within this context, the Force XXI Campaign Plan combines these three complementary efforts in a joint, overlapping endeavor and organizes the entire campaign into three phases. Each of these phases will build on the lessons learned from the last. While we will experiment at all echelons simultaneously, each phase will center on a specific echelon, beginning with the brigade, moving through the division, and on to the corps. Insights at each level can have immediate application beyond the Operational Army. That is what makes the three complementary efforts truly valuable.

The validating event in each phase will be an AWE designed to verify hypotheses regarding the capabilities of the force in question. For example, the Task Force XXI AWE will inform us about how we fight, organize, and command brigades and smaller units with digital technologies. Because we will use divisional combat support, combat service support, and command and control slice elements to support this AWE, we will also learn much about how the division's organization, equipment, training, tactics, techniques, and procedures must be modified. There will probably be analogous lessons for the corps as well. These lessons learned will then inform ongoing and future experiments at those echelons. Similarly, experiments at the division and corps will have a

commensurate impact on the brigade. Further, all of these experiments will inform the Institutional Army about how it must change to create, generate, sustain, and structure the Army of the future. Consequently, redesign of the Institutional Army will follow lessons learned in all three phases.

Phase I

The centerpiece of the initial phase will be the Task Force AWE. Occurring in early 1997, this experiment will involve a digitally equipped, brigade-size experimental force (EXFOR) that is trained and reorganized to exploit the advantages of information-age technology. Composed of a light infantry battalion, a mechanized infantry battalion, an armor battalion, an aviation task force, and a full complement of combat support and combat service supports units, the EXFOR will train extensively with this new equipment and learn how digital and information technology can enhance its lethality and effectiveness. The EXFOR will develop new tactics, techniques, and procedures that optimize its warfighting capabilities.

At the end of the AWE, we will make decisions that lead to the interim designs of the brigade and division, including the functions and capabilities they must possess by echelon. The resulting brigade and division should have greater effectiveness in the objective capabilities discussed in *Force XXI Operations:*

- Lethality.
- Survivability.
- Tempo.

The Task Force AWE will be the culmination of a number of smaller experiments, ACTDs, and ATDs. Two of these experiments, AWE Warrior Focus and AWE Focused Dispatch, are particularly significant. In the fall of 1995 the Dismounted Battle Space Battle Lab will sponsor AWE Warrior Focus at the Joint Readiness Training Center. Warrior Focus will experiment with the organizational design and tactics of a digitized and modernized light infantry battalion. In the process, we will evaluate a number of issues to include the following:

- Battle command links from the soldier to the brigade.
- SOF-Conventional force mission interfaces.
- Joint digitization.
- Owning the night through the use of 2d Generation Forward Looking Infrared Radar (FLIR).
- En route battle command.

That battalion will then use the lessons learned from this experiment and employ them when it participates in the brigade AWE. Particularly important will be any changes to organizational design or tactics that stem from this experiment.

The Mounted Battle Space Battle Lab plans a similar AWE, named Focused Dispatch, in the late summer of 1995. It will center on a mechanized infantry and armor task force that will parallel and complement the Dismounted Battle Lab's effort. Its hypothesis is that procedural, functional, and organizational changes in fire support, intelligence, combat service support, and battle command within the task force will result in significant enhancements in lethality, survivability, and tempo. Focused Dispatch will evaluate organizational changes in the battalion and brigade, digital equipment requirements, training packages for the brigade, battle command at brigade and below, fire support enhancements, alternative combat service support design and operations, and several other issues.

"With the President's goals and the resourcing environment in mind, we are beginning to shape the Army of the next century. Like our partners in the private sector, we are faced with the choice of "changing shape or shaping change" -- and we are smartly choosing the latter. Today in this great Army we are setting our sights on the future -- and the future for tomorrow's Army begins with Force XXI."

Togo D. West, Jr.
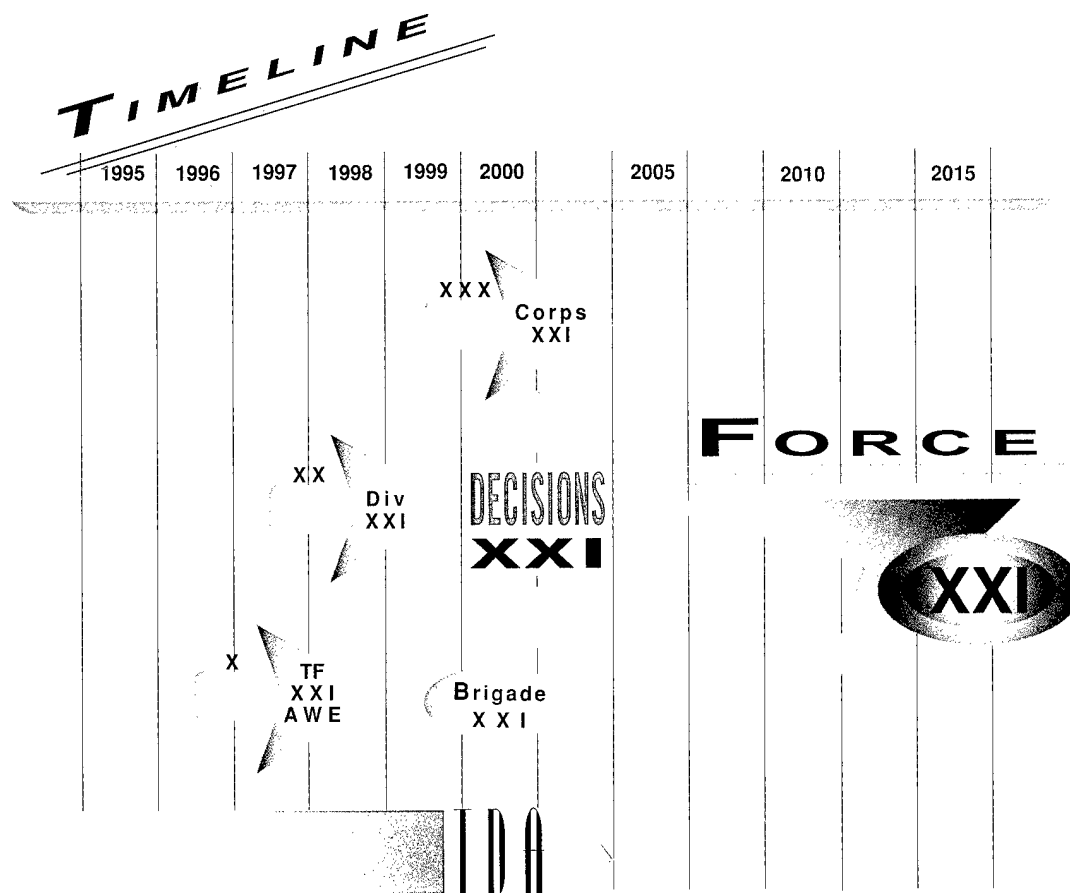
While the primary focusing element in 1997 will be brigade and below, work will be ongoing to align the division and corps. Accordingly, we have scheduled a series of exercises designed to give us insights into the 21st Century division and corps. Most notable of these are Prairie Warrior '95, Roving Sands '95, and Atlantic Resolve '95. Prairie Warrior '95 will continue its experimentation with the MSF and battle command. Roving Sands '95, our annual theater missile defense (TMD) exercise, will address how best to counter an enemy missile threat through a combination of live and constructive simulations at White Sands Missile Range. Atlantic Resolve has replaced our annual REFORGER exercises held during the Cold War. It will continue to be our primary vehicle for examining and learning from the Synthetic Theater of War.

Prairie Warrior '95 is especially important because it centers on the experimental vehicle for exploring the nature of the future division, the MSF. Like Prairie Warrior '94, this exercise is designed to leverage digital technology, and new organizations and tactics on the 21st Century battlefield. Insights from the experiment will help to inform the brigade AWE. Prairie Warrior '95 and other exercises will be conducted in parallel with the brigade-level experiments and, as in the case of the brigade AWE, are designed to be interactive with them. That is, the brigade experiments should inform the organization and operations of the division and corps, and these simulations will help us understand better how the brigade should be organized and fought.

By mid-1997 we will begin shifting our focus from the redesign of the brigade to the redesign of the division. The insights we will have gained throughout the year from the brigade experiments will begin feeding into our division experiments. Moreover, we will have already begun refining the divisional struc-

ture through a series of simulation-driven, warfighting exercises.

This does not mean we will be done with the brigade. We will continue to refine its design and operational concepts as we continue to learn more about what future technology can provide us in subsequent experiments. We will have an advanced prototype of the unit we will ultimately field at the turn of the century. However, the end of Phase I will mean that we are satisfied enough with the initial design and operation of the brigade to turn our main attention to the next higher echelon and look closely at the command and control, combat support, and combat service support structure a future division will need.

The ADO's primary mission during the first phase of the Campaign Plan is to integrate existing systems with new technological developments and commercial off-the-shelf technology to establish a "tactical internet" capability in the EXFOR by early 1996. Then our test units can fully learn the capabilities of the system and properly train with it before the

Task Force XXI AWE in the spring of 1997. To accomplish this mission, we will need to procure the hardware, develop the appropriate software, integrate the new architecture with other critical components of the tactical system, and do all of this under common data standards. Inherent in this process is the need to promote more timely, responsive, focused, and agile assistance to the user in the field — the EXFOR first, and ultimately the Army as a whole. To do this, we will work closely with our partners from industry.

Our efforts to reshape the Institutional Army have been ongoing for four years now. Many of our major commands have already done yeoman's work in redesigning themselves by downsizing, flattening hierarchies, reorganizing how they perform internal functions, and leveraging information-age technologies. Medical Command (MEDCOM), Information Systems Command (ISC), Army Materiel Command (AMC), Intelligence Systems Command (INSCOM), and others have taken significant strides in bettering themselves through the intelligent and creative application of information technology. All of these commands are getting more efficient and effective work
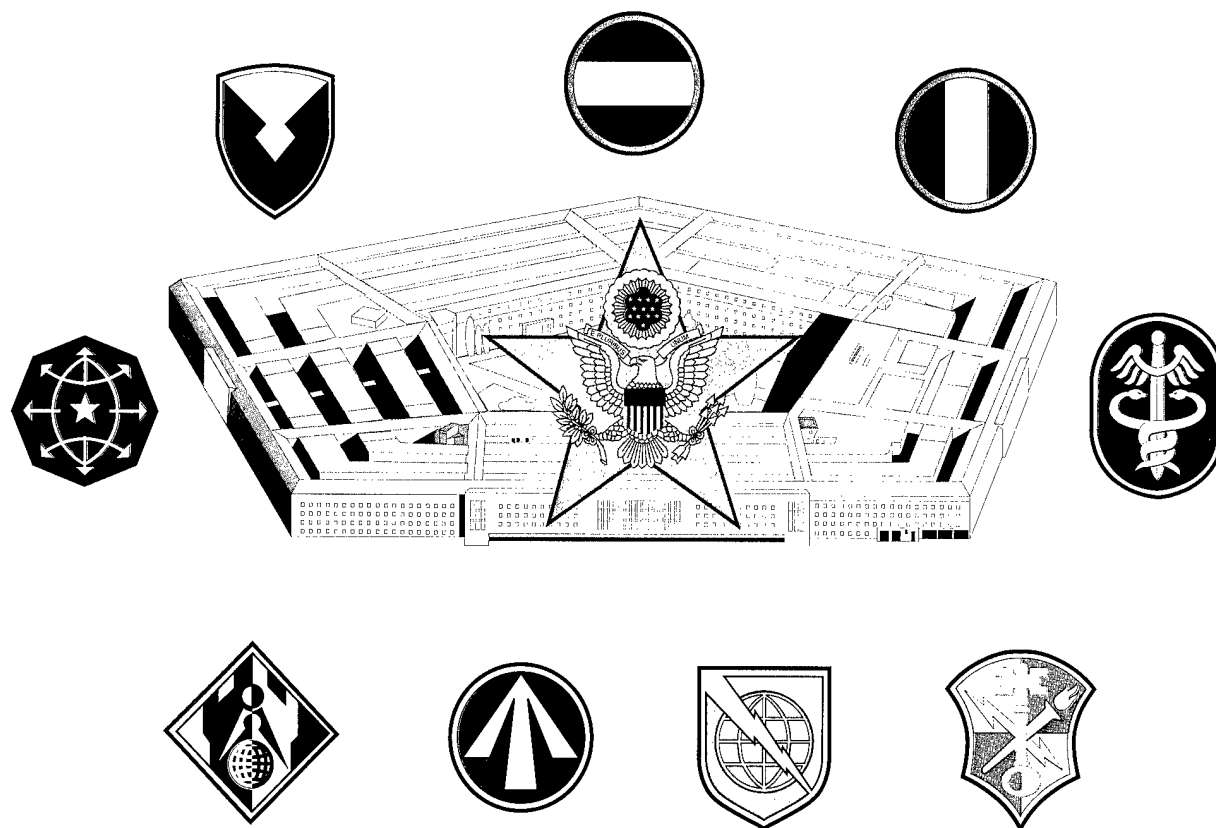
from a smaller work force by leveraging capabilities like video teleconferencing, electronic mail, computer networking, enhanced software technology, telemedicine, intransit visibility, external contracting and the attendant merging or elimination of related functions.

The work just described, however, is only the beginning for our total effort. The next phase focuses on the redesign of the Institutional Army by Title 10 function. While we will continue to reengineer our major commands throughout Phase I, we will begin in earnest to examine which functions we ought to perform, which we could consolidate, which we should eliminate, and who ought to perform these functions. This effort will transcend all of the Army's major commands, and will look at how a function should be performed across the Army. We will scrutinize everything the Army does to recruit, train, organize, administer, mobilize, deploy, maintain, sustain, conduct research and development, and manage its communities. These functions literally form the base from which the Operating Army springs and provides the strategic sustainment base. We will approach the reorganization of the Army from two main directions: internally in each major command, and externally across major functions.

To make these two major efforts successful, we will need to accomplish four main tasks simultaneously. First, we will need to reengineer the Army's major commands under the leadership of their respective commanders. Second, we will need to redesign the Army Staff, its field operating agencies, and its staff support activities. Third, we will have to conduct a comprehensive review of the Army's Title 10, functions. Finally, we will have to conduct an in-depth study to determine which organizational changes in the institutional support structure can leverage information-age technology and improve the Army's ability to accomplish its Title 10 functions.

The third task during Phase I is the comprehensive review of the Army's Title 10 functions. To transform the Institutional Army so it will rationally size and organize itself as we move into the future, we will engage in a top-to-bottom review of these functions. The mechanism for accomplishing this enormous task of redefining how we shape and support the Total Force will be the Functional Area Assessment (FAA). We will supplement this analysis with our findings from our ongoing, year-long General Headquarters Exercise and other internal mechanisms.

Over the course of Phase I, we will analyze every one of the Army's Title 10 functions. The results of this analysis may well affect the ongoing experimentation in the Operating Army and the direction our digitization of the entire Army takes. Conversely, we expect that experiments in the Operating Army will inform our analysis of how we can best create, generate, sustain, and structure the most potent 21st Century Army in the world.

At the end of this initial phase, we will be able to identify the emerging base design of the Institutional Army. The changes we anticipate in the Institutional Army during this phase will complement those in the other two efforts and will play an integral role in our moving the Power Projection Army to an information-age, full dimensional force. As a result, we will see an ever increasing seamlessness and connectivity between the Institutional and Operational forces. What we learn in Phase I will be the basis for our continued experimentation and analysis in the subsequent two phases.

Phase II

Phase II will focus on the design of the division. Inherent in the execution of this phase will be the development of the final design and programmatic decisions to field a divisional force with greater effectiveness. Central to our effort during this phase will be the expansion of the EXFOR concept to encompass division-size operations. This Division XXI will be organized and fielded beginning in 1997 and will be evaluated in both live simulations (field exercises) and in constructive simulations (war games like the Battle Command Training Program).

Employing tactics, techniques, procedures, and organizations developed during Phase I, the EXFOR division will build on the lessons learned and explore the unanswered questions raised as a result of earlier experimentation. We will rely primarily on constructive simulations during this phase. However, as we need to test particular components of the division, especially its command and control apparatus, we will focus experiments or demonstrations on those elements through the use of live forces.

During Phase II, our continuing efforts in the Institutional Army arena will lead to the development of a base support structure for the Army. We will

continue to refine our functional areas as we continue to learn from the Operational Army's experiments and improve upon the organizations and practices developed from the first phase. General Headquarters Exercise '97 will be a major contributor to our ongoing experimentation with and analysis of the functions performed by the Institutional Army.

Phase III

Almost all experimentation at this phase will be done by simulation and will use the major annual exercises to test hypotheses and evaluate concepts. Many, if not most, of the concepts and issues we experiment with and evaluate during Phase III will come out of brigade and division experiments yet to be conducted. Since division and corps level exercises will have been conducted almost from the outset of the campaign, our concept of what a corps looks like should be fairly mature by Phase III. As a validating event, we will use a Corps/Joint Task Force (JTF) Contingency Operations (CONOPS) exercise employing the full range of Force XXI organizations and operations. What we learn from earlier experimentation will surely drive the design of the corps experimental cycle. We will be working from a rolling baseline that will not become clear to us until we are further down the road in our experimentation and redesign. Accordingly, we must be prepared to make the appropriate modifications to our earlier decisions as we learn more about how our new doctrine and technology enhance and change our doctrine, organization, and training.

Phase III will result in the full integration of information-age technology into the entire Army. The conclusion of this phase will result in our making operating force decisions from the individual soldier to the highest levels of the Institutional Army. The ultimate result will be a fully digitized Army prepared to exploit information-age technology and capable of addressing any threat to our national security. Inherent in the creation of this objective force will be the finalization of our keystone doctrine for the 21st Century, a warfighting doctrine that fully exploits our Army's information-age capabilities complete with tactics, techniques, and procedures.

One can best think of Force XXI as the "rolling end state" of a developmental continuum that ultimately results in a series of successively refined future brigades, divisions, and corps. It will be derived from rigorous experimentation that is iterative and linked and allows us to learn from our experience. It will leverage the power of information from the foxhole to the departmental headquarters, and it will cause us to redefine how we fight, how we organize, and how we command.
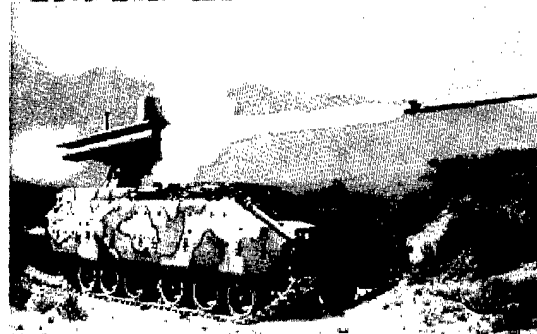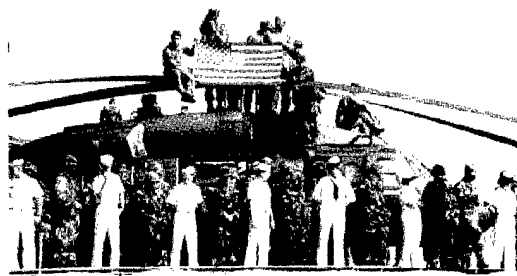
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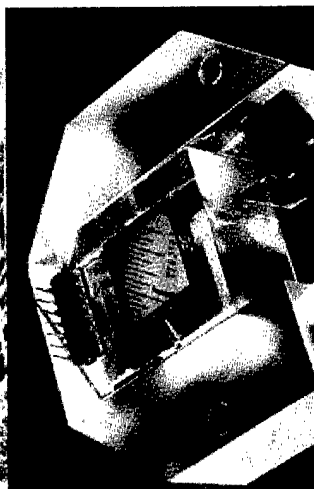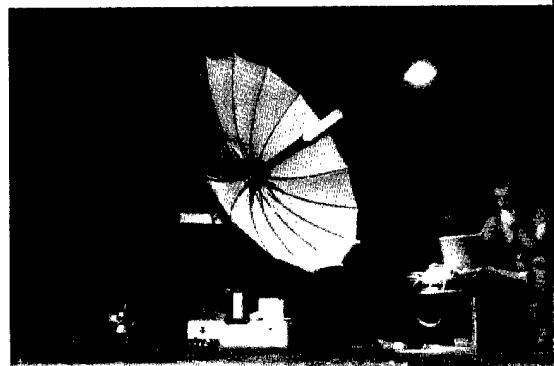
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FORCE XXI – INTO THE FUTURE

What we are doing today is in reality building the Army of 2010 ... for our sons and daughters and our grandchildren. The Army is trained and ready today. We have outstanding equipment, training, and people because of the farsighted decisions by our predecessors. Our challenge today is to be equally farsighted and provide the Nation with a 21st Century force ... a force capable of decisive victory on any battlefield, performing any mission.

What do we know about the Army of 2010? Although we cannot be certain about our missions, we can guess from the character of the world today that the threat of war will not recede. In 2010, the Army must still be ready to fight and win the Nation's wars.

The Army of 2010 will be based primarily in the continental United States. While we will continue to maintain a minimal forward presence in some parts of the world, we will depend on a combination of airlift and sealift to execute the Nation's military strategy. We will support forward-deployed forces directly from bases in the United States. The Power Projection Army is a reality today. It will continue to be so.

By 2010, the battlefield will be "digitized." The incorporation of digital technology across all of our battlefield systems will give commanders unprecedented capability to gather and share tactical information. A task force commander will know the position of every vehicle in his unit, and that same information will be instantaneously available to his supporting or flank units and any other unit in the sector. As the battle continues, supply vehicles will begin loading ammunition and repair parts tailored to unit requirements, because during the battle the onboard computers will have been automatically transmitting the pertinent data to the support base. Our soldiers will perform missions that have been thoroughly planned and rehearsed using advanced simulators and simulations.

The leaders of 2010 will be masters of information technology. We know who those leaders are. The platoon leaders of 2010 are in the first grade and the generals are majors in the Command and General Staff College. They are our sons and daughters ... your sons and daughters. The acceleration of technology as we approach the 21st Century may be daunting to us, but for the leaders of 2010, information technology will be interwoven into the fabric of their lives.

No matter what they know, no matter how much our technology, our weapons, and our organizations have changed, the leaders and soldiers of 2010 will find some things unchanged. Character, commitment, courage -- these values will still be the hallmark of our Army. They have been part of our Army for over 219 years, and they will remain.

The Army has already changed from a Cold War Army to a Power Projection Army. We must continue to change and grow into the future. Nevertheless, even in the information age, the core of the Army remains the same. The Army exists to fight and win the Nation's wars. Our quality young men and women serve this Nation every day, at home and abroad.

Force XXI: America's Army into the 21st Century — Count on Us!